

3. SYSTEM CONTROLLER

3-9. AHC Adapter [PAC-IF01AHC-J]

Advanced HVAC CONTROLLER (hereafter referred to as AHC) comprises of MITSUBISHI ELECTRIC's AHC ADAPTER (PAC-IF01AHC-J) and α2 SIMPLE APPLICATION CONTROLLER* (hereafter referred to as ALPHA2).

* α2 SIMPLE APPLICATION CONTROLLER is one of the Programming Logic Controllers that are manufactured by MITSUBISHI ELECTRIC CORPORATION.

AHC allows for the connection of MITSUBISHI ELECTRIC's air conditioning network system (hereafter referred to as M-NET) to other systems, which was not possible with the use of ALPHA2 alone. AHC provides the following functions.

- 1) Controls external devices using the sensor data of the air conditioning units connected to M-NET.
- 2) Interlocks the operation of air conditioning units and external devices that are connected to ALPHA2.
- 3) Controls air conditioning units that are connected to M-NET.
- 4) Allows for the combined use of the items 1)-3) above.
- 5) Monitors the input/output status of ALPHA2 via a remote controller or a centralized controller.

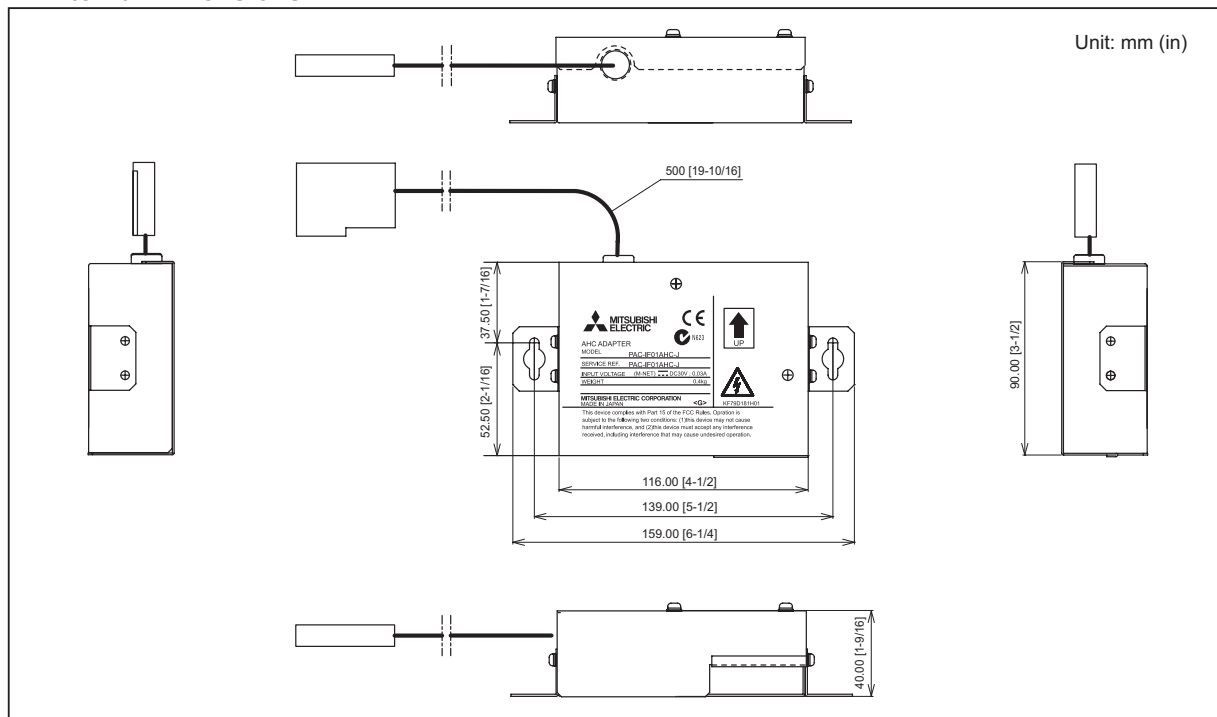
Compatible controllers [As of April 2013 (North America); June 2013 (outside North America)]

- Remote Controller: PAR-U01MEDU, PAR-U02MEDA
- Centralized Controller: EB-50GU-A, AE-200A/AE-50A.

* Refer to the manual that came with ALPHA2 for information about ALPHA2.

* The use of AHC ADAPTER requires either a remote controller or a centralized controller.

■ External Dimensions



⚠ CAUTION

Usage Restrictions

- This manual contains explanations and figures to help the user to properly install, program, and operate AHC.
- All the examples and figures contained in this manual are there for the sole purpose of clarification. It is not guaranteed that AHC will properly work in the types of applications used as examples or are shown in figures. MITSUBISHI ELECTRIC shall not be held responsible for any damage or loss that may result from the use of AHC in the manners shown in the examples and figures contained in this manual.
- Thoroughly read the technical manual, and check the surrounding for safety before changing the settings of AHC in operation (e.g., changing programs or parameters, forcing signal output, or changing the operation status).

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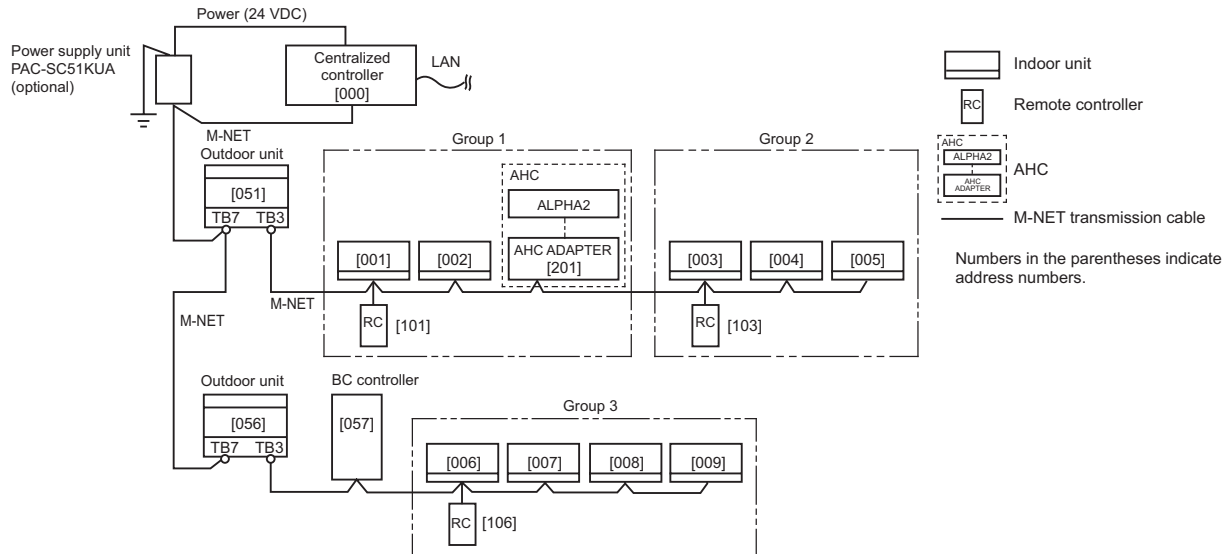
1. Specifications

(1) Device specifications

Item			Specifications
Power supply	M-NET		17–32 VDC
Interface	M-NET transmission terminal		Exclusively for connection to M-NET
	Connector for ALPHA2		Exclusively for connection to ALPHA2
Ambient conditions	Temperature	Operating temperature range	-10°C – +55°C [+14°F – +131°F]
		Storage temperature range	-20°C – +60°C [-4°F – +140°F]
	Humidity		30%–90% RH (Non-condensing)
Dimensions (W × H × D)			116 × 90 × 40 mm [4-9/16 × 3-1/2 × 1-9/16 in.]
Weight			0.4 kg [0.9lbs]
Installation conditions			Inside the metal control box * To be used in a business office or similar environment

1) System configuration

The figure below only shows the transmission cable connections. Power cables are omitted.



* AHC ADAPTER requires either an outdoor unit or a power supply device as a power source.

2) Functions

AHC comprises of an ALPHA2 and an AHC ADAPTER. The use of AHC ADAPTER requires the use of ALPHA2.

The following ALPHA2 are compatible with AHC. Other types of ALPHA2 do not support AHC.

- AL2-14MR-A
- AL2-14MR-D
- AL2-24MR-A
- AL2-24MR-D

Compatible controllers [As of April 2013 (North America); June 2013 (outside North America)]

- Remote Controller: PAR-U01MEDU, PAR-U02MEDA
- Centralized Controller: EB-50GU-A, EB-50GU-J

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AHC enables the connection of M-NET with other systems, which was not possible with the use of ALPHA2 alone. AHC supports the functions listed in Table 1.

Table 1 AHC function list

AHC function	Example	Supplemental Inf.
1) Controls external devices using the sensor data of the air conditioning units connected to M-NET.	<ul style="list-style-type: none"> External heaters are controlled, using the temperature sensors on air conditioning units or on remote controllers. 	By using the sensor on the air conditioning unit connected to the M-NET, no other external sensors will be required.*1
2) Interlocks the operation of air conditioning units and external devices that are connected to ALPHA2.	<ul style="list-style-type: none"> The operation of external heaters is interlocked with the operation of air conditioning units in heating operation. The operation of external humidifiers is interlocked with up to 16 air conditioning units. Humidifiers will go into operation whenever at least one air conditioning unit is in operation. 	Operation status data of a maximum of 2 groups of units can be simultaneously collected. Each group can contain a maximum of 16 units. Error status of a maximum of 50 units can be simultaneously collected.
3) Controls air conditioning units that are connected to M-NET.	<ul style="list-style-type: none"> The ON/OFF operation of air conditioning units is interlocked with the insertion/removal of a card into or out of a card reader. 	A maximum of 2 groups of units can be simultaneously controlled. Each group can contain a maximum of 16 units.
4) Allows for the combined use of the items 1)-3) above.	<ul style="list-style-type: none"> Drying operation of air conditioning units is controlled, using the built-in humidity sensor on the remote controller. 	
5) Monitors the input/output status of ALPHA2 via a remote controller or a centralized controller.		

*1 The sensor on the air conditioning unit connected to the M-NET will collect data at 70-second intervals. If a real time control at intervals shorter than 70 seconds is required, connect a sensor to the Analog Input on ALPHA2.

Note: For detailed information about the functions supported by AHC, refer to the technical manual that came with the AHC.

(2) Field-supplied items

The following items are required to install AHC ADAPTER.

* Two types of installation options (A and B in the table below) are available for AHC ADAPTER. Select the one that is best suited for a given environment.

Field-supplied items		Specifications
A	Unit fixing screw (required when using L-fittings)	M4 x 2 pcs.
B	DIN rail and fixing screw (required when using DIN rails)	DIN rail width: 35 mm (1-13/32 in) Applicable type (IEC 60715/DIN 60715): TH35-7.5Fe, TH35-7.5Al
Functional ground wire		* Use a wire with an appropriate diameter so that the wire can be fixed with the cable strap below the terminal block. A diameter of 10 mm is recommended.
Sleeved ring terminal		M3.5 ring terminal (for M-NET transmission cables (A, B, S)) M4 ring terminal (for functional ground wire)
Transmission cable		<ul style="list-style-type: none"> CVVS Min. 1.25 mm² (Min. AWG 16) * CPEVS: PE*1 insulated PVC*1 jacketed shielded communication cable * CVVS: PVC*1 insulated PVC*1 jacketed shielded control cable * Use cables with an appropriate diameter so that the cables can be fixed with the cable strap below the terminal block. A diameter of 10 mm is recommended.

*1 PE: Polyethylene; PVC: Polyvinyl chloride

[Parts to be Purchased Separately]

Name	Model	Application	Remark
Power supply unit	PAC-SC51KUA	Power supply to the M-NET transmission line	This is not required when power is to be supplied from an outdoor unit.

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[ALPHA2 components]

Name	Model	Power source specification	Optional module (Note 1)	Number of ports				Remark
				Digital Input (DI)	Analog Input (AI)(Note 2)	Digital Output (DO)	Analog Output (AO)(Note 2)	
ALPHA2	AL2-14MR-D	Requires a separate 24 VDC power source.	-	8	(8)*	6	-	
			AL2-4EX	12	(8)*	6	-	
			AL2-4EYT or AL2-4EYR	8	(8)*	10	-	
			AL2-2DA	8	(8)*	6	2	
	AL2-24MR-D	Requires a separate 24 VDC power source.	-	15	(8)*	9	-	
			AL2-4EX	19	(8)*	9	-	
			AL2-4EYT or AL2-4EYR	15	(8)*	13	-	
			AL2-2DA	15	(8)*	9	2	
	AL2-14MR-A	Requires a separate 100-240 VAC power source.	-	8	-	6	-	
			AL2-4EX-A2	12	-	6	-	
			AL2-4EYR	8	-	10	-	
	AL2-24MR-A	Requires a separate 100-240 VAC power source.	-	15	-	9	-	
			AL2-4EX-A2	19	-	9	-	
			AL2-4EYR	15	-	13	-	

* The AI ports for the DC type are shared by DI, with a maximum number of 8 AI ports.

* AI and AO cannot be used with the AC type ALPHA2.

(Note 1) I/O Extension Module /Analog Expansion Module

I/O Extension module

- EI: Digital input extension module of ALPHA2. 4 digital input ports can be added.
Type name: AL2-4EX-A2 (AC type) and AL2-4EX (DC type)
- EO: Digital output extension module of ALPHA2. 4 digital output ports can be added.
Type name: AL2-4EYR (AC type) and AL2-4EYT (DC type)

Analog Expansion module

- AO: Analog output extension module of ALPHA2. 2 analog output ports can be used.
Type name: AL2-2DA (DC type)

Only one of the above EI, EO, and AO can be used.

(Note 2) Analog signals that can be used for AI and AO of the DC type ALPHA2

- Analog Input (AI): 0-10V, PT100(*), thermocouple(*)
(*) To use a PT100 or thermocouple, a temperature sensor module is required separately.
Type name: AL2-2PT-ADP(PT100 sensor), AL2-2TC-ADP(Thermocouple)
(Converts the PT100/thermocouple to 0-10V)
- Analog Output (AO): 0-10V, 4-20mA

For details, refer to the ALPHA2 manuals (Installation Manual and Hardware Manual).

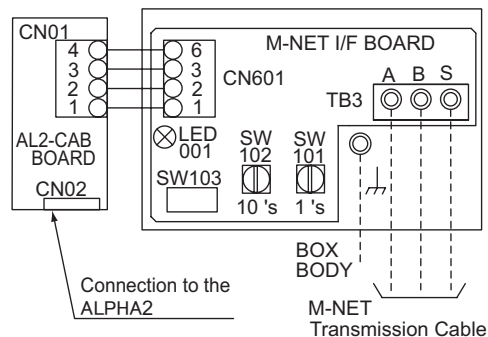
[Commercially available parts]

Name	Application	Remark
External 24 VDC power source	Supplies power to the ALPHA2 and/or Extension module.	Check to see if an external 24 VDC power source is required for a specific ALPHA2 and an Extension module.
Sensor	Measures temperature and humidity, etc.	Some sensors require additional parts.

For details, refer to the ALPHA2 manuals (Installation Manual and Hardware Manual).

2. Wiring Instructions

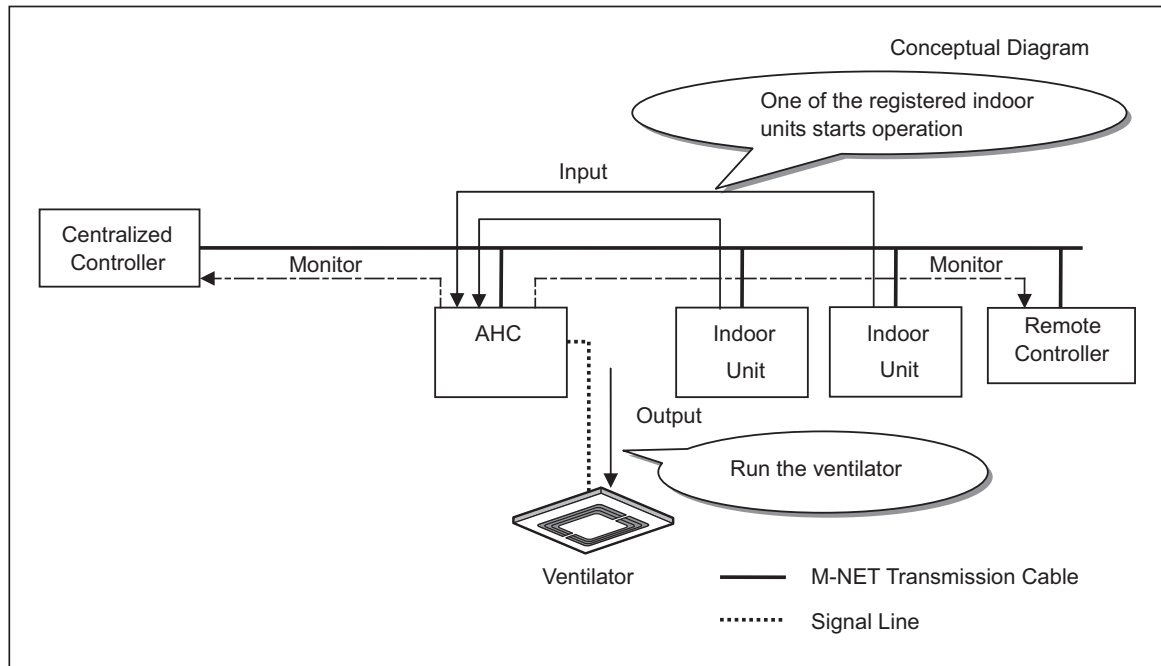
Connecting the Power and M-NET Transmission Cable.



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3. Combination and Application Example of the Input Information and Equipment Items

Interlocking with the external Ventilator Using the Start and Stop Information of Multiple Air Conditioners



Interlocking the Heater, Humidifier, and Fan

